

What is claimed is:

1. An electrolytic gold plating method for performing electrolytic gold plating on a surface of a substrate body using a gold sulfite plating solution, the method comprising the steps of:

detecting a deterioration degree of said plating solution; and

performing said plating.

2. An electrolytic gold plating method for performing electrolytic gold plating on a surface of a substrate body using a gold sulfite plating solution, the method comprising the steps of:

irradiating light to said plating solution;

measuring a light intensity after said irradiation;

- and

performing said plating.

3. An electrolytic gold plating method for performing electrolytic gold plating on a surface of a substrate body using a gold sulfite plating solution, the method comprising the steps of:

measuring a pH of said plating solution; and

performing said plating.

4. An electrolytic gold plating method for performing electrolytic gold plating on a surface of a substrate body using a gold sulfite plating solution, the method comprising the steps of:

measuring sulfurous acid in gold sulfite complex in

said plating solution; and

performing said plating.

5. An electrolytic gold plating method for performing electrolytic gold plating on a surface of a substrate body  
5 using a gold sulfite plating solution, the method comprising the steps of:

measuring sulfuric acid in said plating solution; and  
performing said plating.

6. An electrolytic gold plating method for performing  
10 electrolytic gold plating on a surface of a substrate body using a gold sulfite plating solution, the method comprising the steps of:

measuring at least one of an amount of gold colloid  
of said plating solution, a value of pH of said plating  
15 solution, a concentration of sulfurous acid in gold sulfite complex in said plating solution and a concentration of sulfuric acid in said plating solution;

calculating a deterioration degree of said plating  
solution based on said measured value; and

20 performing said plating based on said deterioration degree.

7. An electrolytic gold plating method according to any one of claims 1 to 6, the method further comprising the step of performing at least one of addition of said plating  
25 solution, adjustment of pH, adjustment of sulfurous acid concentration and adjustment of sulfuric acid based on said value obtained by measuring at least one of an amount of

gold colloid of said plating solution, a value of pH of said plating solution, a concentration of sulfurous acid in gold sulfite complex in said plating solution and a concentration of sulfuric acid in said plating solution.

- 5 8. An electrolytic gold plating apparatus for performing electrolytic gold plating on a surface of a substrate body using a gold sulfite plating solution, which comprises a detecting means for detecting a deterioration degree of said plating solution.
- 10 9. An electrolytic gold plating apparatus for performing electrolytic gold plating on a surface of a substrate body using a gold sulfite plating solution, which comprises at least one of means for irradiating light to said plating solution and measuring a light intensity after said
- 15 irradiation, means for measuring a pH of said plating solution, means for measuring sulfurous acid in gold sulfite complex of said plating solution, and means for measuring sulfuric acid of said plating solution.
- 20 10. An electrolytic gold plating apparatus according to claim 9, wherein said means for measuring said light intensity is an absorptiometer.
11. An electrolytic gold plating apparatus according to any one of claims 9 and 10, wherein said means for measuring said pH is a pH meter using a glass electrode.
- 25 12. An electrolytic gold plating apparatus according to any one of claims 9 to 11, wherein said means for measuring said sulfurous acid in said complex or sulfuric acid is an

automatic titrator or a liquid chromatograph.

13. An electrolytic gold plating apparatus according to any one of claims 9 to 12, which comprises a monitoring unit for displaying a value measured by at least one of  
 5 said means for measuring a light intensity, said means for measuring said pH, said means for measuring sulfurous acid and said means for measuring sulfuric acid.

14. An electrolytic gold plating apparatus for performing electrolytic gold plating on a surface of a substrate body  
 10 in a gold plating bath containing a gold sulfite plating solution, which comprises:

an absorptiometer for irradiating light to said plating solution and measuring a light intensity after said irradiation;

15 a pH meter for measuring a pH of said plating solution;

a concentration measurement unit consisting of an automatic titrator or a liquid chromatograph for measuring a concentration of at least one of sulfurous acid or  
 20 sulfuric acid in said plating solution;

pipes for individually connecting said absorptiometer, said pH meter and said concentration measurement unit to said gold plating bath, said pipes making said plating solution to pass through; and

25 a personal computer for displaying quality of said plating solution based on a value measured by at least one of said absorptiometer, said pH meter and said concentration

measurement unit.

15. An electrolytic gold plating apparatus according to any one of claims 8 to 14, which comprises:

an automatic adding solution supply unit for adding  
5 said plating solution based on a value obtained by measuring at least one of an amount of gold colloid of said plating solution, a value of pH of said plating solution, a concentration of sulfurous acid in gold sulfite complex of said plating solution and a concentration of sulfuric acid  
10 of said plating solution;

an automatic pH adjustment unit for adjusting pH; and

an automatic water supply unit for supplying water for evaporated water.

16. An electrolytic gold plating apparatus according to  
15 any one of claims 8 to 15, which comprises:

an anode, an object to be plated and an opening portion in a plating bath, said anode being vertically arranged, said object to be plated being arranged opposite to said anode, said opening portion being arranged at a  
20 side surface portion of said plating bath;

a substrate stage for vacuum-holding said object to be plated, said substrate stage detachably attached to said plating bath in a state of blocking said opening portion; and

25 a pushing unit for pushing and releasing said substrate stage to and from said opening portion.